

## Chapter 13

# Mechanical

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### Section 1300.0 Scope

**Sec. 1300.1 General:** All mechanical systems, including heating, air conditioning, ventilating, plumbing, sanitary, and water systems, in or serving buildings or structures in a Special Flood Hazard Area shall be designed and installed to comply with the requirements of this chapter.

### Section 1301.0 Heating, Air Conditioning, and Ventilation Systems

**Sec. 1301.1 Applicability:** Heating, air conditioning, and ventilation systems, including all appurtenances, in buildings or structures in a Special Flood Hazard Area shall be designed and installed to comply with the requirements of these Regulations.

**Sec. 1301.2 Location:** Heating, Air Conditioning, and Ventilating Equipment should, to the maximum extent possible, be installed in areas and spaces of buildings that are above the RFD. When not feasible, said equipment shall be located in W1 or W2 spaces (below the RFD) with direct access provided from a location above the RFD, and shall conform to all requirements of this Section.

**Sec. 1301.2.1:** Heating systems utilizing gas or oil fired furnaces shall have a float operated automatic control valve installed in the fuel supply line which shall be set to operate when floodwaters reach an elevation equal to the floor level of the space where furnace equipment is installed. A manually operated gate valve that can be operated from a location above the RFD shall be provided in the fuel supply line to serve as a supplementary safety provision for fuel cutoff. The heating equipment and fuel storage tanks shall be mounted on and securely anchored to a foundation pad or pads of sufficient mass to overcome buoyancy and prevent movement that could damage the fuel supply line. As an alternate means of protection, elevation of heating equipment and fuel storage tanks above the RFD on platforms or by suspension from overhead structural systems will be permitted. All unfired pressure vessels will be accorded similar treatment. Fuel lines shall be attached to furnaces by means of flexible or swing type couplings. All heating equipment and fuel storage tanks shall be vented to an elevation of at least \_\_\_\_ feet above the RFD. Air supply for combustion shall be furnished if required for systems installed in W1 or W2 spaces, and piping or duct work for such purpose shall be terminated at least \_\_\_\_ feet above the RFD.

**Sec. 1301.2.1.1:** All duct work for warm air heating systems which is located below the RFD shall be provided with emergency openings for internal flooding and drainage of the ducts with all openings having covers with gravity operators for closure during normal operation. Where duct work must pass through a watertight wall or floor below the RFD, the duct work shall be protected by a mechanically operated closure assembly and shall be provided with the operator control position above the RFD. The closure assembly in its open position shall not impede the normal function of the heating system.

**Sec. 1301.2.1.2:** Steam or hot water heating pipes located below the RFD shall be provided with shut-off valves sufficient to isolate the piping system when it is likely that the forecasted flood crest level will expose the piping system to flooding.

**Sec. 1301.2.1.3:** Electric heating systems, where utilized in Special Flood Hazard Areas, shall be installed in accordance with requirements of Chapter 12.

**Sec. 1301.2.2:** Air conditioning and ventilation systems that will be located below the RFD shall be installed in W1 or W2 spaces only. All installation, piping, duct work, connections, and safety features shall conform to the same requirements stated for Heating Systems in 1301.2.1.

**Sec. 1301.2.3:** Where heating, air conditioning, or ventilating systems (as defined in 1301.2) are installed in other than W1 or W2 spaces, all bearings, seals, shafts, gears, clutches, valves, or controls which are susceptible to damage from contact with water or silt, or are not capable of withstanding hydrostatic or hydrodynamic loading, shall be provided with suitable protective waterproofing enclosures as may be required by the Building Official.

**Sec. 1301.2.4:** All fuel supply lines that originate either outside of W1 or W2 spaces or pass through areas that would be flooded, shall be equipped with automatic shut-off valves to prevent loss of fuel in the event of a line breakage. The wall opening shall be flood proofed by use of imbedded collars, sleeves, waterstops, or other means as may be approved by the Building Official.

**Sec. 1301.2.5:** Electrical connections to all mechanical systems covered by this chapter shall conform to the requirements of Chapter 12.

## **Section 1302.0 Plumbing Systems**

**Sec. 1302.1 Applicability:** For the purpose of these Regulations, plumbing systems shall include sanitary and storm drainage, sanitary facilities, water supply, storm water and sewage disposal systems.

**Sec. 1302.1.1:** Except as otherwise provided herein, nothing in these Regulations shall require the removal, alteration, or abandonment of, nor prevent the continued use of, an existing plumbing system.

**Sec. 1302.1.2:** Plumbing materials shall be selected with due consideration given to the hydrostatic, hydrodynamic, and chemical actions of floodwaters on the interior of piping systems, of the soil, fill, or other materials on the exterior of piping systems, on joints, connections, valves, traps, seals (and caulking), and fixtures.

**Sec. 1302.2:** Systems below RFD: Sanitary sewer and storm drainage systems that have openings below the RFD shall be provided with automatic back water valves or other automatic backflow devices that are installed in each discharge line passing through a building exterior wall. In W1 spaces, manually operated shut-off valves that can be operated from a location above the RFD shall also be installed in such lines to serve as a supplementary safety provision for preventing backflow in case of automatic backflow device failure or line break between the space(s) and the device.

**Sec. 1302.2.1:** Spaces in buildings that are to be protected from floodwaters by implementation of the Owner's Contingency Plan may utilize standpipes attached to floor drains, cleanouts, and other openings below the RFD, and/or manually operated shut-off valves or closure devices.

**Sec. 1302.2.2:** Where the state of dryness of a space is dependent on a sump pump system, or where the stability of a structure during a flood event depends on the relief of uplift pressures on building components, all interior storm water drainage or seepage, appliance drainage, and underslab drain tile systems shall be directly connected to a sump (pump) and discharged at an elevation at least \_\_\_\_ feet above the RFD.

**Sec. 1302.2.3:** Sanitary sewer systems, including septic systems, that are required to remain in operation during a flood shall be provided with a sealed holding tank and the necessary isolation and diversion piping, pumps, ejectors, and appurtenances required to prevent sewage discharge during the flood. The holding tank shall be sized for storage of at least 150 percent of the anticipated demand for the duration of a flood to the RFD.

**Sec. 1302.2.3.1:** All vents shall extend to an elevation of at least \_\_\_\_ feet above the RFD.

**Sec. 1302.2.3.2:** All pipe openings through walls below the RFD shall be flood proofed to prevent floodwater backflow through spaces between pipes and wall construction materials. (See 1301.2.4)

**Sec. 1302.3 Sewage Disposal/Treatment:** Individual sewage disposal and/or treatment facilities, except for cesspools and seepage pits, will be permitted in a Special Flood Hazard Area but only at locations where connection with a public sewer system is not possible or feasible. The design of such systems shall take into consideration their location with respect to wells or other sources of water supply, topography, water table, soil characteristics, available area for improvements, and the effects of flooding to the RFD. Installations in low swampy areas or areas with generally high water tables or which may be subject to periodic flooding will not be permitted.

**Sec. 1302.3.1:** Cesspools will not be permitted as permanent installations for sewage disposal, except that in those instances where connection to a public sewer system will be possible within a one (1) year period, the Building Official may approve such an installation as a temporary expedient. The one (1) year period shall expire on the anniversary date of the written approval of the Building Official. Because of the public health hazard involved, extreme care shall be exercised in locating the cesspool. Under no circumstances shall a cesspool be located closer than 150 feet to a water supply well or be permitted to penetrate the groundwater stratum.

**Sec. 1302.3.2:** Seepage pits shall, for purposes of these Regulations, conform to the same requirements set forth above for cesspools.

**Sec. 1302.4 Water Supply:** Potable water supply systems that are located in a Special Flood Hazard Area shall be designed and installed in such a manner as to prevent contamination from floodwaters up to the RFD. No water supply well shall be located within the foundation walls of a building or structure located in a Special Flood Hazard Area used for human habitation, medical or educational services, food processing, or public service type facilities.

**Sec. 1302.4.1:** Water supply wells, tanks, filters, softeners, heaters, and all appliances located below the RFD shall be protected against contamination by covers, walls, copings, or castings. All vents shall be extended to a minimum elevation of \_\_\_\_ feet above the RFD.

**Sec. 1302.4.2:** Approved backflow prevention devices shall be installed on main water service lines at water wells and at all building entry locations to protect the system from backflow or back siphonage of floodwaters or other contaminants in the event of a line break. Devices shall be installed at accessible locations and shall be maintained in good working condition by the person(s) responsible for maintenance of the water supply system.

**Sec. 1302.4.3:** Individual water supply wells that are utilized in Special Flood Hazard Areas shall be of either the drilled or driven type and located at a site slightly higher than surrounding ground levels to assure positive drainage from the well.

**Sec. 1302.4.3.1:** Private potable water well supplies shall not be developed from a water table located less than 25 feet below the ground surface, nor from any deeper supply which may be polluted by contamination entering through fissured or crevice formations.

**Sec. 1302.4.3.2:** Each well shall be provided with a watertight casing to a distance of at least 25 feet below the ground surface and shall extend at least one foot above the well platform. Casings shall be large enough to permit installation of a separate drop pipe with a watertight seal between the drop pipe and the casing. Casings shall be sealed at the bottom in an impermeable stratum or extend several feet into the water bearing stratum.

**Sec. 1302.4.4:** In the event that floodwater contamination occurs in the water supply system, all potable water equipment, piping, water storage tanks, etc. shall be disinfected in the manner prescribed by the National Plumbing Code.